



City of Lodi Stormwater Development Standards Plan



City of Lodi
Stormwater Development Standards Plan
May 29, 2008

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Revision Record

Revision Date	Description of Revisions	Revisions Made by	Approved by
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1.0 Purpose and Goals of the City of Lodi Stormwater Development Standards

The City of Lodi has developed this Stormwater Development Standards Plan (DSP) in response to the requirements contained in its Municipal Separate Stormwater Sewer System (MS4) NPDES Permit. However, this DSP document also will assist Lodi to accomplish the following objectives:

- To assist the City of Lodi in the gradual development of its master plan for the overall management and infrastructure for stormwater conveyance and control.
- To provide well-defined and consistent stormwater development standards and an equitable review and approval process for Lodi's future development and significant redevelopment.
- To protect the quality of the stormwater runoff and the receiving waters that surround Lodi.

The following describes in more detail the purpose and goals of this DSP.

1.1 The Function of the Stormwater Development Standards Plan

The following six statements summarize the function of the DSP:

Summary of the City of Lodi's Development Standards Plan

- **Initiated** by the developer during the design phase or as a result of mitigation measures identified during the CEQA review.
- **Implemented** during City of Lodi's Plan Check Process.
- **Identifies** minimum, drainage zone-specific, and activity-specific best management practices (BMPs).
- **Incorporates** the California Stormwater Quality Association (CASQA) approved design standards and mitigation measures identified during the CEQA review.
- **Involves** Lodi Public Works and Building Departments.
- **Integrates** Lodi's overall Stormwater Management Plan.

1.2 Regulatory Basis

On October 5, 2000, the California State Water Resources Control Board (State Board) adopted Order WQ 2000-11, which set as a precedent the requirement to utilize Standard Urban Stormwater Mitigation Plans (SUSMPs, later referred to as Development Standards). The SUSMPs were initially adopted by the Los Angeles Regional Water Quality Control Board (RWQCB) to require treatment controls for new development and significant redevelopment. However, recognizing that the decision included significant legal or policy determinations



that are likely to recur (Gov. Code 11425.60), the Central Valley RWQCB in concurrence with the State Board decided to be consistent with applicable portions of the State Board's decision and include Development Standards requirements in the MS4 permits. As part of Phase II, the State Board adopted a General Permit for the Discharge of Stormwater from Small MS4s (WQ Order No. 2003-0005-DWQ) to provide permit coverage for smaller municipalities, including non-traditional Small MS4s, which are governmental facilities such as military bases, public campuses, and prison and hospital complexes. The City of Lodi was identified as one of these small MS4s and, therefore, prepared a Stormwater Management Plan (SWMP) in January 2003. This DSP was prepared in accordance with the requirements contained in the City's MS4 permit.

1.3 Stormwater Management and Infrastructure Planning

One of the purposes of this DSP is to assist Lodi in the overall management and infrastructure planning for handling of stormwater runoff to prevent localized flooding, erosion of surfaces, sedimentation deposits, and to assure that its discharge to the receiving water does not cause problems due to volume or rate of discharge. Therefore, the BMPs specified in this DSP, not only address water quality, but also form a part of the overall stormwater management strategy of Lodi. Several stormwater detention basins are operated by the City to control runoff for events up to a 100-year storm. These detention basins also function as sports facilities (baseball fields, soccer fields, etc.), but their primary purpose is flood control. Table 1-3 summarizes the storm drain basins maintained by the City. A map of outlet locations is included in [Appendix A](#).

Table 1-3 Storm Drain System Basin Data

Basin/Park	Tributary Area (acres)	Site Land Area (acres)	Detention Capacity (ac. ft.)	How low and nuisance flows are handled.
A-1, Kofu	491	12 ¹	41.5	Pumped to the WID
A-2, Beckman	564	16.2 ²	60.0	Pumped to the WID
B-1, Vinewood	964	16.0	41.5	Pumped to the WID
B-2, Graves ³	450	13.2	31.1	Pumped/flows to Mokelumne R.
C -1	Approx. 591			Pumped/flows to the Mokelumne R.
C-2, Pixley ⁴	Approx. 500	27.3	128.7	Pumped/flows to Pixley
D, Salas	790	21.0	94.0	Pumped to the WID
E, Peterson	340	20.9	61.0	Pumped/flows to the Mokelumne R.
F (at Kettleman)	369	30.0	68.5	Pumped/flows to DeBenedetti
F (near Tokay)		30.0	68.5	Pumped/flows to DeBenedetti
G (DeBenedetti)	866	46.3	202.0	Detains its own flows
H (Discharge to River)	428			Pumped/flows to the Mokelumne R.
I (Undeveloped)	320	25.0		Pumped/flows to DeBenedetti
Total:	6,673	227.9	728.3	

Table Notes:

Italics indicate future or partially complete facilities.

WID is the Woodbridge Irrigation District canals that ultimately discharge to the Delta.

¹Kofu acreage includes park south to tennis courts, excludes Municipal Service Center (MSC) & MSC parking.

²Beckman acreage excludes Fire Station.

³Glaves Park formerly Twin Oaks Park.

⁴Pixley volume does not include 7 ac. ft. in Beckman Rd. ditch.

As demonstrated by Table 1-3, the eleven drainage basins can be categorized into three main groups based on how and where the non-stormwater nuisance flows and low storm volumes are directed. The following is a summary of these groups:

Direct Discharge to the Mokelumne River:

All water that flows to the City's storm drains in Drainage Basin H discharges directly to the Mokelumne River. This includes nuisance flows and low and high stormwater flows. (Nuisance flows are defined as non-stormwater discharges from a variety of sources. Low stormwater flows are generally from stormwater events less than or equal to a 2-year, 24-hour storm event. High stormwater flows are generally from a storm event greater than a 2-year, 24-hour event.) Drainage Basins B-2, C-1, and E also are included in this grouping because, although they retain high flows of stormwater in their respective detention basins, nuisance and low flows are discharged directly to the Mokelumne River.

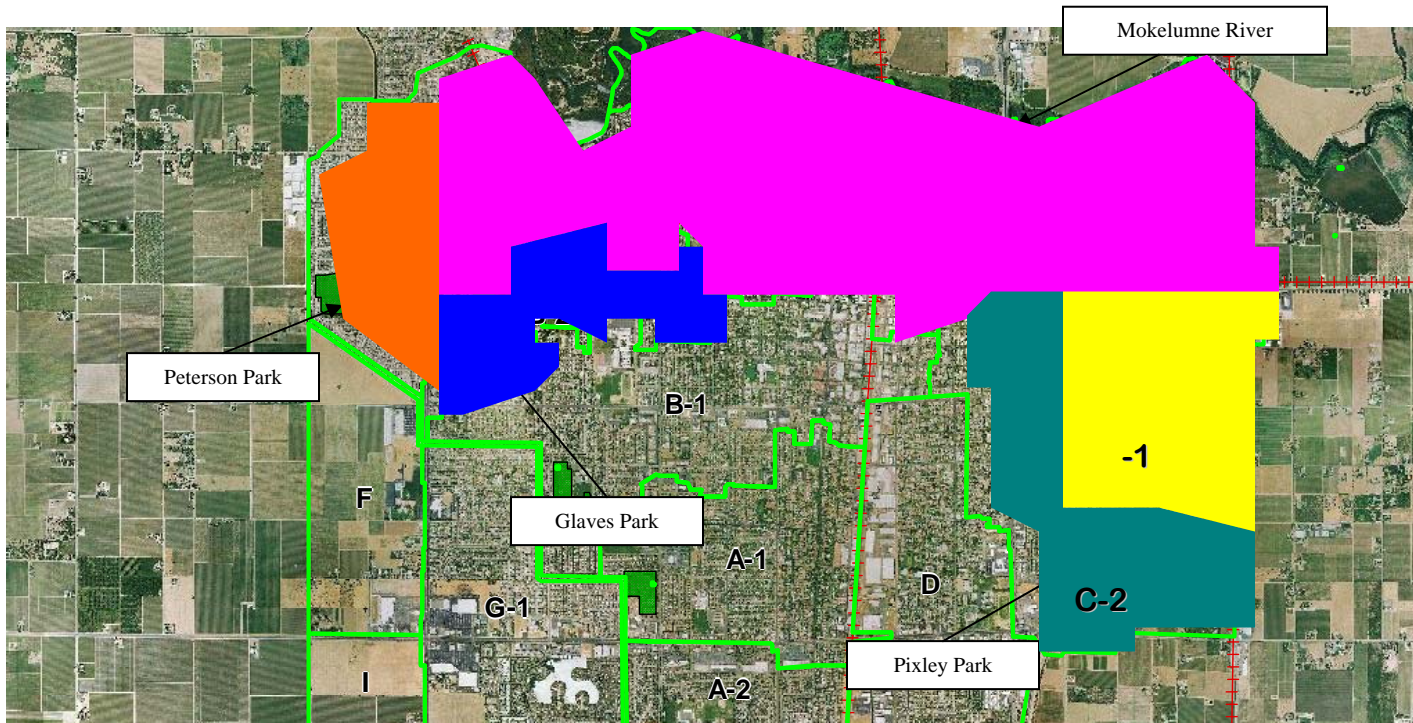


Figure 1 – Approximate Area (shaded) that Drains Directly to the Mokelumne River
(For exact areas, refer to the Basin Drainage Areas map in [Appendix A.](#))

Discharge to the Woodbridge Irrigation District:

Nuisance flows and low stormwater flows that enter the City's storm drains in Drainage Basins A-1, A-2, B-1, and D are discharged directly to the Woodbridge Irrigation District (WID) canal. High flows from significant stormwater events are directed to the respective detention basin for each drainage area.

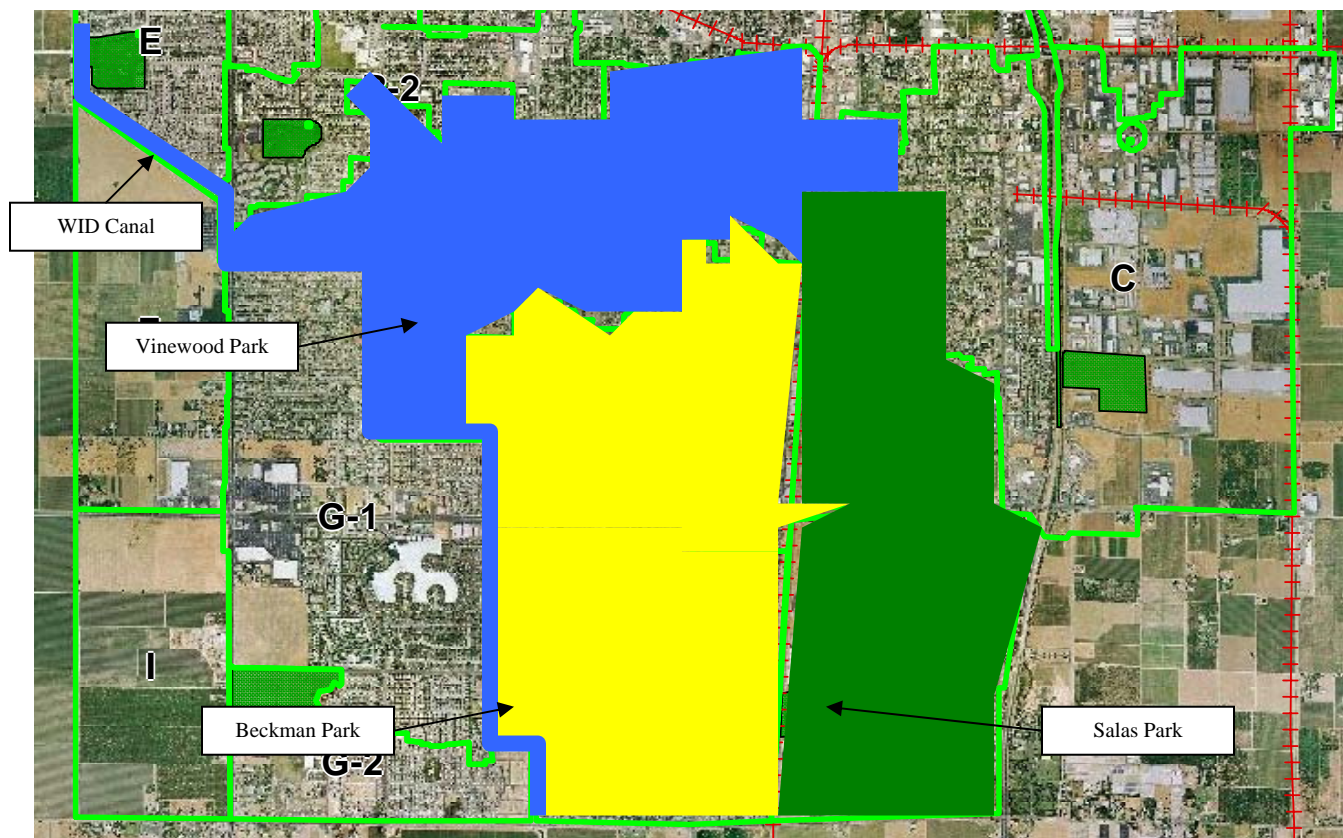


Figure 2 – Approximate Area (shaded) that Drains to the WID
(For exact areas, refer to the Basin Drainage Areas map in [Appendix A.](#))

Retained within the Basin:

Nuisance flows and low stormwater flows that enter the City's storm drains in Drainage Basin G are discharged directly to the DeBenedetti Park and are allowed dissipate by evaporation and percolation in that detention basin. The same is the case for Drainage Basin C-2 (**Figure 1**) that discharges to Pixley Park. High flows from significant stormwater events are usually kept in the detention basin but, in case of very heavy flow, may be discharged to the WID canal. Nuisance flows and low stormwater flows that enter the City's drains and private drains in Drainage Basins F and I are pumped to DeBenedetti Park. High flows from significant storm events are captured and retained within Basins F and I by private and municipal detention systems.

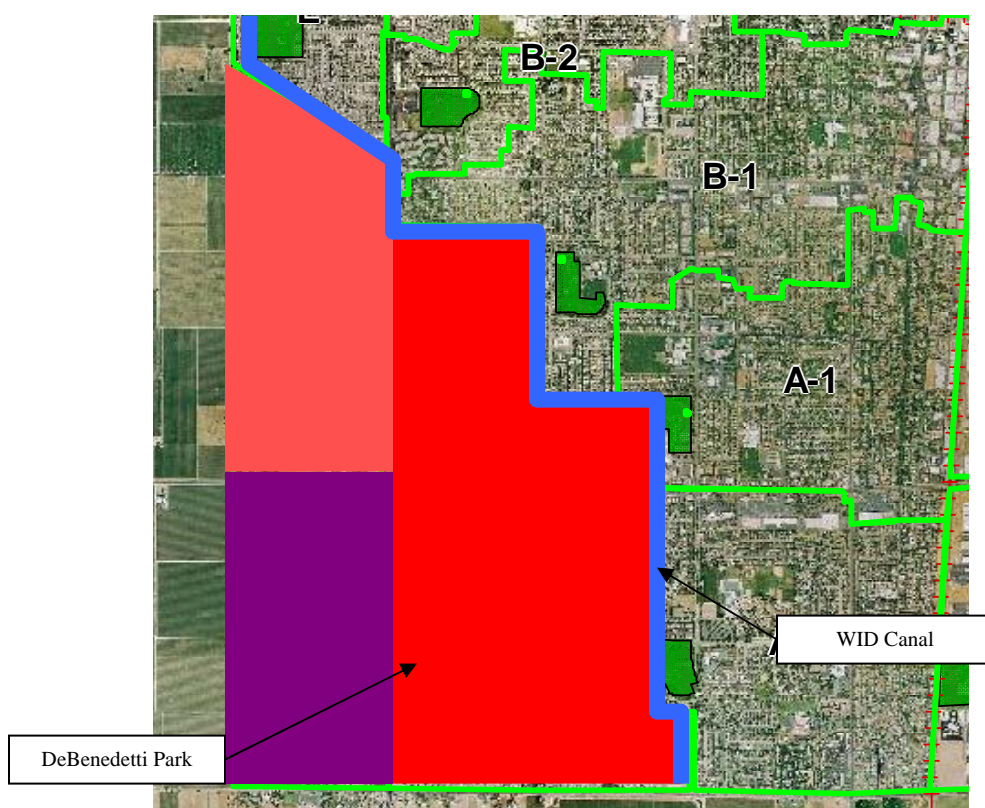


Figure 3 – Approximate Area (shaded) that Captures and Detains its own Runoff
(For exact areas, refer to the Basin Drainage Areas map in [Appendix A.](#))

Each of the three above-referenced drainage zones has unique characteristics and features that present drainage zone-specific benefits and potential problems concerning the volume and rate of stormwater runoff and the quality of the water. Therefore, this DSP specifies BMP requirements that are specific to each drainage zone, which will assist Lodi in managing its stormwater runoff in a safe and efficient manner.



1.4 Consistency and Equality

The City of Lodi desires to be fair and equitable with all of its residents and developers. Lodi wants to establish a development standard that can be consistently applied to every developer. This DSP is a way of establishing a consistent standard and process to be followed by every development and significant redevelopment from this point onward. However, it is also understood that it is extremely difficult, if not impossible; to have a “one-size” fits all standard. Lodi has attempted to incorporate standards that will be useable by the majority of the developers, but the process also allows a certain customizing of standards in a manner that is fair and equitable to other Lodi residents and developers. The measures that are built into the process to allow flexibility include the following:

- When sizing a treatment control BMP, the State of California allows for volume-based or a flow-based sizing criteria to be used. However, the State also allows for equivalent criteria to be used. For example, a developer may propose a performance-based criterion. In other words, a BMP is proposed that is guaranteed to meet the water quality objectives and is so demonstrated by analytical testing.
- Lodi is incorporating the [CASQA control measures](#) into this DSP by reference, which provides a wide variety of approved and State of California recognized treatment control BMPs that may be considered by the developer for incorporation into the design. Notwithstanding, should the developer want to use a BMP that is not specified in detail, as described in BMP standard [LODI-99](#), the developer may propose an alternative control measure that meets the volume, flow, or equivalent sizing criteria.
- Certain projects will fall under the DSP requirements, but the developer may argue that the DSP requirements are not logical and provide no real benefit to Lodi’s management of stormwater and the water quality objectives. In those rare occasions, the developer has an appeal option. The developer may appeal the DSP requirements to the Community Development or the Public Works Department Head, as appropriate, which will then determine if the appeal has merit and should be brought before the City Council in a public hearing. During the hearing and comment period, other Lodi residents and developers will have an opportunity to comment on the proposed deviation from the DSP. This public hearing will be a part of the CEQA process and will result in a ruling by the City Council.



1.5 Water Quality Protection

The City of Lodi, as a member of this community, is very concerned and committed to protecting the water quality of our neighboring Mokelumne River, the Delta, and surrounding waterways. Not only is Lodi committed to it as a responsible member of the community, but also Lodi is committed to that goal by specific language in the stormwater permit.

The City of Lodi's MS4 permit states the following:

- *“Discharges shall not cause or contribute to an exceedance of water quality standards contained in a Statewide Water Quality Control Plan, the California Toxics Rule (CTR), or in the applicable RWQCB Basin Plan.”*
- *“The permittees shall comply with [these] Receiving Water Limitations through timely implementation of control measures and other actions to reduce pollutants in the discharges in accordance with the SWMP and other requirements of this permit including any modifications.”*
- *“Permittees must implement BMPs that reduce pollutants in stormwater to the technology-based standard of MEP (Maximum Extent Practicable). The MEP standard is an ever-evolving, flexible, and advancing concept, which considers technical and economic feasibility. As knowledge about controlling urban runoff continues to evolve, so does that which constitutes MEP. Reducing the discharge of stormwater pollutants to MEP in order to protect beneficial uses requires review and improvement, which includes seeking new opportunities. To do this, the Permittee must conduct and document evaluation and assessment of each relevant element of its program and revise activities, control measures, BMPs, and measurable goals, as necessary to meet MEP.”*
- *“Regulated Small MS4s subject to this requirement must adopt an ordinance or other document to ensure implementation of the Design Standards included herein or a functionally equivalent program that is acceptable to the appropriate RWQCB. The ordinance or other document must be adopted and effective prior to the expiration of this General Permit or, for Small MS4s designated subsequent to the Permit adoption, within five years of designation as a regulated Small MS4.”*



2.0 The Implementation Process

Implementation of Lodi's Development Standards involves the following five general steps:

1. Determination of the applicability of the DSP to the developer / redeveloper by the Community Development Department. ([Section 2.1](#))
2. Determination of CEQA requirements. ([Section 2.2](#))
3. Identification of the BMP requirements and sizing criteria and incorporation into the project design. ([Section 2.3](#))
4. Planning Commission or Site Plan and Architectural Review Committee (SPARC) review. ([Section 2.4](#))
5. Confirmation of the BMPs through an inspection program. ([Section 2.5](#))

2.1 Determination of Applicability

All new development and qualifying "significant redevelopment" will be subject to at least the minimum BMPs identified in [Section 3.1](#) of this DSP. However, depending upon the nature and location of the development, other BMPs may also apply to the development or redevelopment project. The following defines the applicability of this plan to new development and "significant redevelopment".

2.1.1 New Development

All new development will be required to implement minimum BMPs that are common, industry-accepted design practices, which are not overly burdensome and do not involve large capital expenditures. These minimum BMPs are listed in [Section 3.1](#) of this plan.

In Lodi's MS4 permit, certain types of developments have been identified by the State of California as "Priority Categories" (refer to [Section 2.3.3.1](#)). In addition to the minimum BMPs, developments falling under these categories are required to implement mandatory industry-specific BMPs that are identified in [Section 3.2](#), drainage zone-specific BMPs as identified in [Section 3.3](#), and stormwater treatment control measures that are properly selected and sized as referenced in [Section 3.4](#).

Lodi has identified certain industrial activities that also must implement the treatment controls for any new development. These industrial activities are identified in [Section 2.3.3.2](#) of this plan. As with the priority categories, new developments for any of the listed industrial activities must implement treatment controls that are identified in [Section 3.2](#) for the drainage zone corresponding to the development, and select and properly size one or more of the treatment controls listed in [Section 3.4](#).



2.1.2 Redevelopment

Lodi's development standards apply to all significant redevelopment projects falling under the identified "Priority Categories" listed in [Section 2.3.3.1](#) of this plan and to the industrial activities identified in [Section 2.3.3.2](#) of this plan. "Significant redevelopment" is defined by the following:

"Significant Redevelopment" is defined as the creation or addition of at least 5,000 sq. ft. of impervious surfaces on an already developed site.

Significant redevelopment does not include replacement of impervious surfaces that is a part of routine maintenance, such as the repair and/or replacement of an asphalt parking lot; or the replacement of a building(s) or other structures where the net increase of impervious surface is less than 5,000 sq. ft.

2.2 Determination of the CEQA Requirements

The City of Lodi will determine if a project is discretionary, and thus applicable to the California Environmental Quality Act (CEQA). If it is a discretionary project, the City Planning Division will determine one of four environmental review levels for the project:

- Categorical Exemptions;
- Negative Declaration requiring no mitigation measures;
- Negative Declaration requiring mitigation measures; and
- Environmental Impact Report (EIR) and associated mitigation measures.

The project applicant is required to submit the project information on the City's [Uniform Application](#). (A copy of the form is included in [Appendix B](#).) Plan Check will mark the preliminary environmental assessment box, if the project meets the CEQA criteria. The City will then determine the appropriate level of environmental review. It is important to note that stormwater mitigation measures, identical or similar to those presented in the DSP, may be selected for projects based on the environmental assessment results regardless of whether a project meets the DSP applicability criteria.



2.3 Selection and Sizing of BMPs

Every new development and significant redevelopment is required to incorporate into the final design the applicable standards listed below prior to completing the approval process described in [Section 2.4](#) of this plan. These standards include the minimum BMPs, drainage zone-specific BMPs, and treatment control measures. The standards also include sizing criteria for treatment control measures and requirements for groundwater and downstream erosion protection.

2.3.1 Minimum BMPs that Apply to All New Development and Redevelopment

Lodi is requiring that minimum BMPs be required of all new development and significant redevelopment projects. All of the BMPs must be incorporated into the development / redevelopment design, as they may be applicable to the proposed project. Refer to [Section 3.1](#) for a list and brief description of the minimum BMPs.

For Additional BMP Details, Refer to the Following Reference:

CASQA Stormwater BMP Handbook
<http://www.cabmphandbooks.com/Development.asp>

2.3.2 Minimum BMPs that Apply to Applicable New Development and Redevelopment Occurring in Specific Drainage Zones

As described in [Section 1.3](#) of this plan, Lodi has three distinct drainage zones. Each of these zones has unique drainage characteristics and challenges. In order to protect water quality and to address concerns with stormwater runoff management of each of these zones, Lodi is specifying BMPs specific to each drainage zone for applicable new development and significant redevelopment. Applicable new development includes development for any of the State-specified Priority Categories and the City of Lodi-specified industrial activities referenced in [Section 2.3.3](#). The required BMPs are listed and described in [Section 3.2](#) of this plan. The following is the rationale for Lodi's BMP selection for these drainage zones.



2.3.2.1 Areas that Directly Discharge to the Mokelumne River

Drainage Basins B-2, C-1, E and H are areas that drain directly to the Mokelumne River. The types of developments found in this zone vary greatly including residential, commercial, and undeveloped. But, the majority of the City's industry is also located within this area and includes heavy industrial with significant storage of materials and chemicals that could threaten stormwater quality. Of primary concern are nuisance flows and spills that may enter the City's storm drainage system and flow to manholes and pump stations in these areas; which, once the water level in them reaches a high level, will cause the flow to be discharged directly to the Mokelumne River without abatement. Therefore, the BMPs listed in [Section 3.3.1](#) are designed to assist Lodi in addressing these issues.

2.3.2.2 Areas that Discharge to the WID

Another group of drainage basins discharge nuisance water (including spills) and low flows of stormwater to the WID canal. They include Drainage Basins A-1, A-2, B-1, and D. Similar to the direct discharge drainage basins, non-stormwater discharges and spills may also reach the receiving water by route of the WID canal. However, less stringent BMPs are required because the area tends to have less industry and provides more opportunities to head-off the discharge before it reaches the receiving water. BMPs corresponding to this area are listed in [Section 3.3.2](#).

2.3.2.3 Areas that Retain Nuisance Flows

Drainage Basins C-2, F, G-1, G-2, and I either provide on-site capture and detention of their nuisance flows, spills, and low stormwater flows (by private / non-city owned systems) or flows that enter the City's storm drainage system are pumped / directed to either DeBenedetti or Pixley parks for dissipation via evaporation and percolation. Therefore, no area specific BMPs are required for this drainage zone. However, it is important to note that development in these areas are more likely to have stormwater mitigation measures placed on them through the CEQA process described in [Section 2.2](#).



2.3.3 Identification of Applicable New Development Projects and the Associated Pollutants of Concern

The State of California and the City of Lodi have identified categories of new development that will require properly selected and sized treatment control measures. ([Section 2.3.4](#) addresses the sizing criteria.) BMPs must also be selected based on the pollutants of concern associated with the new development. This section lists the types of developments and activities that have been identified by the State of California and Lodi that require treatment control, and describes the associated pollutants of concern.

2.3.3.1 State of California Priority Categories

Table 2.3.3.1 lists the Priority Categories identified in Lodi's MS4 permit and depicts the pollutants of concern associated with each type of development.

Table 2.3.3.1 – New Development Priority Categories and Pollutants of Concern¹

New Development Project Category	Pollutant Category of Concern						
	Sediment	Nutrients	Metals	Trash & Debris	Oxygen Demand	Toxic Organics	Bacteria
Commercial Developments ($\geq 100,000$ sf)	X	X	X	X	X	X	X
Automotive Repair Shops	X		X	X	X	X	
Retail Gasoline Outlets	X		X	X	X	X	
Restaurants		X		X	X	X	X
Parking Lots ($\geq 5,000$ sf or 25 spaces)	X		X	X	X	X	
Home Subdivisions (≥ 10 units)	X	X	X	X	X	X	X

X = Pollutant likely to be present in stormwater runoff from the project area

For future developments that fall under any of the listed categories, BMP selection will need to include measures to mitigate the pollutants of concern listed in Table 2.3.3.1.

¹ Source of the table is the [Small MS4 NPDES General Permit \(Water Quality Order 2003-0005-DWQ\)](#), Attachment 4, page 2 and [CASQA New Development and Redevelopment Handbook](#), January 2003 edition, Table 2-1, page 2-7.



2.3.3.2 City of Lodi Specified Industrial Activities

Lodi has identified industrial activities that are common to the business within the City and have identified pollutants of concern for each of the listed activities.

Table 2.3.3.2 – Lodi Specified Industrial Activities and Pollutants of Concern

New Development Industrial Activity	Pollutant Category of Concern											
	Toxic Organics	Sulfur, Sulfides, Sulfates	Nutrients	Metals	Trash & Debris	Oxygen Demand	Oil & Grease	Bacteria	pH	Dissolved Solids	Suspended Solids	Sediment
Cement, Concrete, and Aggregate Operations				X	X		X		X	X	X	X
Sulfur Distribution, Storage and Handling		X		X	X	X	X		X	X	X	X
Wineries, wine processing and packaging.			X		X	X			X		X	X
Agricultural Products Storage & Handling	X	X	X	X	X	X	X	X	X	X	X	X
Other Chemical Storage & Handling	X	X	X	X	X	X	X		X	X	X	X
Food Products Processing, Storage & Handling			X	X	X	X	X	X	X	X	X	X
Paper and Plastic Recycling					X	X	X		X		X	X
Auto Wrecking, Dismantling, and Body Shops; Metal Salvage / Recycling	X			X	X		X		X		X	X
Railroad Operations				X	X		X				X	X
Highways and Freeways	X			X	X		X				X	X

X = Pollutant likely to be present in stormwater runoff from the project area



Table 2.3.3.2 shows pollutants of concern that may be associated with each of the corresponding industrial activities. However, if it can be demonstrated that one or more of the identified pollutants of concern is not applicable to the proposed development, Lodi will only require BMPs for those pollutants of concern that are applicable to the project.

2.3.4 Numeric Sizing Criteria for Treatment Control Measures

The MS4 permit specifies sizing criteria for treatment control measures. The permit states that the developer may size the proposed BMP on a volume determination to capture 80% or more of the volume recommended in the California Stormwater Quality Association (CASQA) BMP Handbook, or as a flow rate determination based on the 85th percentile of the recorded hourly rainfall intensity multiplied by a factor of 2. The developer may also select an equivalent sizing criterion, such as a performance-based standard, to achieve the same reduction in pollutant loads that will meet the water quality objectives.

For the Lodi area, dependent upon the runoff coefficient (% of water that flows offsite), the Stormwater Quality Design Volume (SQDV) is approximately 0.4 to 0.8 inches of rain multiplied by the area of the facility to yield a total volume. The Stormwater Quality Design Flow (SQDF) criterion is approximately 0.10 inches/hour, which is multiplied by 2 to yield a total of 0.2 inches / hour.

For consistency, the City of Lodi will adopt what other local municipalities have specified in their development standards plans; a SQDF of 0.2 inches / hour and a SQDV calculated by a rainfall storage figure ranging from 0.1 to 0.6 inches (depending upon the % imperviousness) multiplied by the area. The developer is to utilize the DSP worksheet contained in [Appendix B](#) and provide the SQDV calculations. The City of Lodi will use the following reference documents to review and approve sizing of BMPs for proposed developments.

Reference Sources for BMP Sizing Guidance:

California Stormwater Quality Association Stormwater Best Management Practice Handbook – New Development and Redevelopment

<http://www.cabmphandbooks.com/Development.asp>

Urban Runoff Quality Management, WEF Manual of Practice No. 23 / ASCE Manual of Practice No. 87, (1998)

<http://www.wef.org>



2.3.5 Infiltration and Groundwater Protection Measures

Developers that propose BMPs, which are designed primarily as infiltration devices (for example, a detention basin or infiltration trench), will be required to do the following:

- Demonstrate how potential pollutants that may infiltrate into the soil and groundwater will be kept from being discharged to the infiltration BMP.
- Propose and commit to a monitoring program to periodically verify that pollutants in the surface water are not impacting the soil and groundwater.

2.3.6 Downstream Erosion and Protection Measures

Where applicable, project plans must include BMPs consistent with other Lodi ordinances and building codes to decrease the potential of slopes and /or channels from eroding and impacting stormwater runoff. These erosion control measures may consist of the following:

- Convey runoff safely from the tops of slopes and stabilize disturbed slopes.
- Utilize natural drainage systems to the maximum extent practicable.
- Stabilize permanent channel crossings.
- Vegetate slopes with native or drought-tolerant vegetation, as appropriate.
- Install energy dissipaters, such as rock, at the outlets of new storm drains, culverts, conduits, or channels that enter unlined channels in accordance with applicable specifications to minimize erosion, with the approval of all agencies with jurisdiction, e.g., the U.S. Army Corps of Engineers and the California Department of Fish and Game.



2.3.7 Low-Impact Development (LID)

The City of Lodi is committed to the design concept of Low-Impact Development (LID). Certain aspects of this Development Standards Plan address and mandate LID. Mandatory minimum BMP SD-11 requires that all roof drains be directed to a permeable area or an infiltration trench to capture runoff from a 2-year, 24-hour or smaller storm event. Regional BMP LODI-05 requires applicable developers to capture and divert nuisance flows away from storm drains. Applicable development and redevelopment are also encouraged to select one of the following LID treatment control BMPs:

- Vegetated buffer strips (TC-31);
- Vegetated swales (TC-30);
- Extended detention basins (TC-22);
- Wet ponds (TC-20);
- Constructed wetlands (TC-20 & MP-20);
- Detention basin / sand filter (TC-40);
- Porous pavement detention (TC-40 & SD-20);
- Porous landscape detention (TC-32 & TC-40);
- Infiltration basins (TC-11);
- Infiltration trenches (TC-10); and
- Retention / irrigation (TC-12).

The City of Lodi recommends that all developers consider incorporating the following LID design measures into their development plans:

- Use of large spreading trees, which provide energy dissipation and peak flow reduction for storm events;
- Preservation of natural areas for stormwater infiltration;
- Design landscape with bioretention cells that collect and absorb stormwater from impervious areas;
- Use of permeable pavers or paving material for landscaping, pathways, and low traffic areas;
- Install cisterns and vector-proof rain barrels for the collection and reuse of stormwater (watering from these sources would be exempt from the City's landscape watering restrictions);
- Grade parking lots to drain to adjacent landscaped areas that have bioretention cells; and
- To the extent possible, route surface flows along a grassy swale or other permeable surface, rather than an impervious surface.

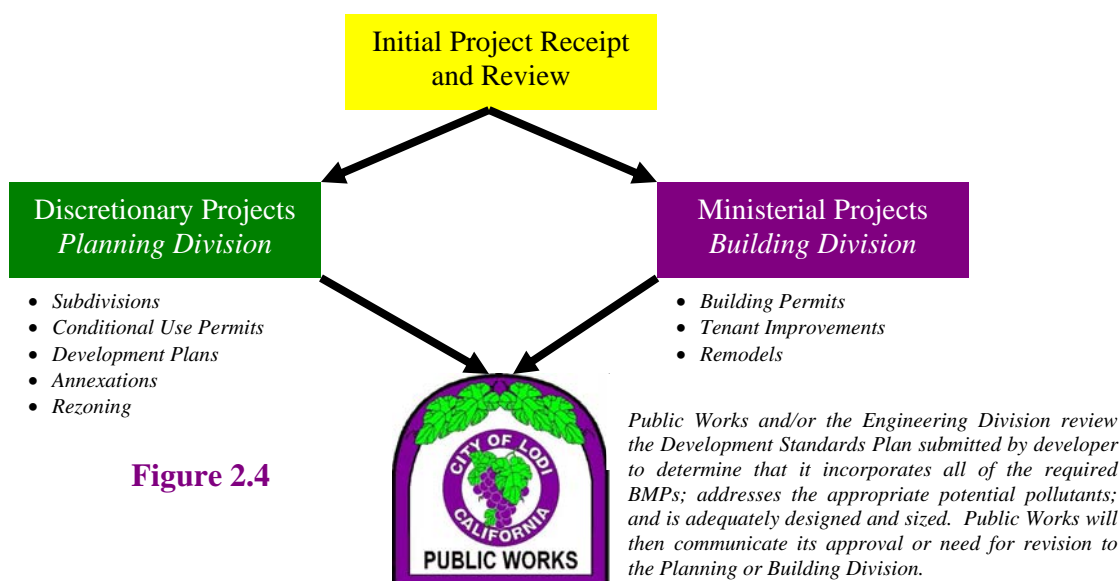
*For more information on
Low-Impact Development
go to ...*

<http://www.epa.gov/owow/nps/lid/>

<http://www.lowimpactdevelopment.org/>

2.4 Approval Process

The City of Lodi has established an approval process to review and approve the BMP requirements for new development and significant redevelopment. [Figure 2.4](#) summarizes the process. Incorporated into the approval process are the following BMP design reviews.



2.4.1 Initial Plan Review

The Developer provides the initial submittal for plan review by the Planning or Building Division including the completed Uniform Application, the Environmental Assessment Form (if required), three sets of construction drawings, summary development table and filing fees. The division receiving the plans will then review the submittal and make a determination of 1) the applicability of the DSP and 2) requirement of an environmental assessment (CEQA review). If either or both are required, the developer is notified and provided with a copy of the DSP and the necessary forms.

2.4.2 Environmental Assessment Review

If the project is discretionary and, therefore, subject to an environmental assessment, the Planning Division will inform the project developer of the applicable requirements. As described in [Section 2.2](#), the Planning Division will determine which level of environmental assessment is required including: a categorical exemption, an Environmental Impact Report (EIR), a negative declaration, or a negative declaration with mitigation measures. For projects subject to the CEQA requirements, public notification and a public meeting may be required. Mitigation measures identified as part of the CEQA process may include the applicable BMPs and control measures identified in this plan. However,



depending upon the specifics of a project, additional mitigation measures may be required to satisfy the CEQA requirements.

2.4.3 Planning Commission or Site Plan and Architectural Review Committee (SPARC) Review

If the project is discretionary, it will require a public review process. Once the developer has incorporated into the proposed design the DSP requirements and the CEQA mitigation measures (if approved), the final plans are submitted for the Planning Commission or SPARC reviews. Projects may require a public hearing. At this time, the developer may also appeal the DSP requirements to the planning commission if he/she believes that the requirements are not applicable or are infeasible to incorporate into the design. The Planning Commission and/or SPARC may also place additional stormwater control measure requirements on the developer / project based on their own review and/or public comment.

Summary of the DSP Process:

- 1) Determination of the applicability of the DSP to the developer / redeveloper by the Planning or Building Division.
- 2) Determination of CEQA requirements.
- 3) Identification of the BMP requirements and sizing criteria and incorporation into the project design.
- 4) Public Works and/or Engineering Department review and approval.
- 5) Confirmation of the BMPs through an inspection program.



2.4.4 Final Plan Submittal

When the plans for the proposed new development or significant redevelopment are received, Plan Check will review the plans and notify the developer of its completeness or request missing information.

To be deemed “complete”, plans must contain the following ...

- ✓ Identify and show on the drawings all required treatment controls and best management practices.
- ✓ Identify the sizing criteria used for the treatment control practices and show the calculations.
- ✓ Identify and show on the drawings the site hydraulics including drainage area, hydraulic gradient, infiltration rate, runoff coefficient, impervious areas, and peak flow rate.
- ✓ Show drainage systems on drawings including all drains, piping, culverts, detention/retention areas, and outfalls.
- ✓ Drawings and calculations are to be certified and stamped by a registered civil Professional Engineer.
- ✓ A written BMP maintenance plan.

Community Development and Public Works will review the proposed development and control measures and will compare it to the requirements of this DSP. Public Works will notify Plan Check of any inadequacies in the submitted plans so that the developer can make modifications and resubmit the plans.

2.4.5 City of Lodi BMP Maintenance Agreement

In conjunction with Plan Check’s review and subsequent approval of the developer’s proposed BMPs and control measures, the developer or property owner will be required to complete and sign an agreement to maintain in proper working order all of the BMPs and control measures included in the approved development design. The agreement will state that if the signatory does not properly maintain the BMPs and control measures, the City of Lodi will have the right to perform the maintenance and charge the responsible party for any work performed on its behalf. The developer / owner will need to have their signature notarized and pay a fee for recording of the document at the County Records office. Lodi Public Works Department will keep a copy of all agreements on file and perform periodic inspections to assure that the responsible party is



performing the proper maintenance. The BMP Maintenance Agreement Form is included in [Appendix B](#).

2.5 Inspection Process

The City of Lodi will confirm that the proposed BMPs and control measures are implemented by performing the following inspections.

2.5.1 During Construction

As described in Lodi's Stormwater Management Program, during the wet season, the Public Works Department or its agent will perform monthly inspections of the construction activities to confirm that adequate construction BMPs are in place and that runoff from the construction site meets Lodi's water quality objectives. The Public Works Department will inspect the construction progress to assure that the proposed BMPs and treatment controls are being installed to the approved specification.

2.5.2 Post-Construction

Once construction is complete, the Public Works Department will perform a final inspection to assure that the BMPs and treatment control measures were installed to the approved specification and that they are functioning properly.

2.5.3 During Normal Operations

Periodically the Public Works Department will inspect the facility to assure that the BMPs and treatment control measures are in use and are being properly maintained. The facility will be notified of any deficiencies and a time schedule will be set to correct any problems. If corrective action is not taken by the responsible party by the set deadline, the Public Works Department or its agent will perform the identified action and bill that party for the labor and expenses.

3.0 Approved BMPs

All new development projects in the City of Lodi are required to have incorporated certain minimum BMPs as described below. Other BMPs specific to the drainage-zone and treatment control measures are required for applicable new development (as defined in [Section 2.1.1](#)) and for significant redevelopment (as defined in [Section 2.1.2](#)). These drainage zone specific BMPs and treatment control measures are described below.

The City of Lodi has decided to incorporate the BMPs and treatment control measures identified in the *California Stormwater Quality Association Stormwater Best Management Practice Handbook for New Development and Redevelopment* (CASQA BMP Handbook). The following sections identify and briefly describe the recommended BMPs. Also, for ease of reference, listed next to each BMP is the corresponding CASQA code. For additional design and sizing information refer to the following reference materials:

Reference Sources for BMP Design and Sizing:

California Stormwater Quality Association Stormwater Best Management Practice Handbook – New Development and Redevelopment
<http://www.cabmphandbooks.com/Development.asp>

Urban Runoff Quality Management, WEF Manual of Practice No. 23 /
 ASCE Manual of Practice No. 87, (1998)
<http://www.wef.org>

3.1 Mandatory Minimum BMPs

The following is a listing and brief description of the minimum BMPs that apply to all new development, where applicable.

3.1.1 Storm Drain Message and Signage (SD-13)

All storm sewer system drains, catch basins, and inlets must be clearly labeled to indicate that only stormwater is allowed and that the drain flows to the Mokelumne River or the Delta. For City of Lodi street drains, labels are provided by the City of Lodi as shown here. Refer to CASQA Development BMP Handbook [SD-13](#).





3.1.2 Roof Drain Design (SD-11)

All roof drains are to be directed to a permeable area or an infiltration trench so that runoff from a 2-year, 24-hour or smaller storm event will not enter the City of Lodi's municipal stormwater sewer system. The capture and reuse of the water for same initial flow volume is also an acceptable BMP. Refer to CASQA Development BMP Handbook [SD-11](#).

3.1.3 Outdoor Material Storage Area Design (SD-34)

Materials stored outside must be stored in such a way as to prevent stormwater from coming in contact with materials that may contaminate stormwater or to prevent contaminated stormwater from discharging from the site without treatment. Refer to CASQA Development BMP Handbook [SD-34](#).

3.1.4 Outdoor Trash Storage Area Design (SD-32)

All trash enclosures for all non-residential and residential developments having more than two separate residences are to be on impervious surfaces, surrounded by a screen or a wall to prevent wind blown trash and debris, and covered with a rain-proof structure. Refer to CASQA Development BMP Handbook [SD-32](#).

3.1.5 Outdoor Loading / Unloading Dock Area Design (SD-31)

Floor surfaces are to be constructed with materials that are compatible to those being loaded / unloaded. The loading / unloading dock must have a covering that extends at least 3 feet beyond the loading dock, or be equipped with a seal or door skirt used to cover all material transfers between the trailer and the building. The grade or berming must prevent run-on from surrounding areas, while downspouts and roof drains must be directed away from the loading areas. Direct connections into a storm drain from the loading dock are prohibited. Stormwater may only be discharged from the loading dock via a manually controlled system after the water quality has been found to not compromise Lodi's water quality objectives or after it has been treated. Refer to CASQA Development BMP Handbook [SD-31](#).

3.1.6 Outdoor Repair / Maintenance Bay Design (SD-31 & SD-35)

Surfaces of equipment (vehicles, machinery, or other equipment) maintenance / repair areas are to be constructed with Portland cement concrete. Cover or berm areas where equipment with fluids are stored. Cover or enclose all equipment maintenance / repair areas. Grade the area to drain to a dead-end sump for collection of all wash water, leaks, and spills. Direct connections of the maintenance / repair areas to the storm



drain are prohibited. Refer to CASQA Development BMP Handbook [SD-31](#) and [SD-35](#).

3.1.7 Outdoor Vehicle / Equipment / Accessory Washing Area Design (SD-33)

The wash pad is to be constructed on Portland cement concrete. The entire wash area must be covered. The grade or berming must prevent run-on from surrounding areas and downspouts and roof drains must be directed away from the wash area. Wash water is prohibited to enter the storm sewer system. If the wash water is to be discharged to the sanitary sewer system, the City of Lodi Wastewater Division must be contacted. A permit and pretreatment may be required prior to discharging to the sanitary sewer. Refer to CASQA Development BMP Handbook [SD-33](#).

3.1.8 Swimming Pool and Fountain Filters (LODI-01)

The installation of swimming pool filters which use diatomaceous earth (D.E.) as a media is prohibited. A porous media filter, sand filter, or other City-approved filter must be used. For other swimming pool and fountain BMPs, refer to CASQA Municipal BMP Handbook [SC-72](#).

3.1.9 Sample / Observation Box (LODI-02)

All new development projects that have a connection to the City's municipal storm drainage system must install an easy-to-access sample collection / observation box downstream of the last private drain inlet. All stormwater runoff from the property must flow through a sample / observation box. Multiple sample / observation boxes may be used where there is more than one connection to the City's storm drainage system.



3.2 Priority-Category BMPs

The following BMPs have been mandated by the State for all new and significant redevelopment of five of the six priority categories identified on [Table 2.3.3.1](#). Housing development is the one category that is not identified with specific BMPs in the MS4 Permit.

3.2.1 100,000 Square Foot Commercial Developments

- 1) Properly Design Loading / Unloading Dock Areas – Loading / Unloading Dock Areas have the potential for material spills to be quickly transported to the stormwater conveyance system. To minimize this potential, the following design criteria are required:
 - a) Cover loading dock areas or design drainage to minimize run-on and runoff of stormwater.
 - b) Direct connections to storm drains from depressed loading docks (truck wells) are prohibited.
- 2) Properly Design Repair / Maintenance Bays - Oil and grease, solvents, car battery acid, coolant and gasoline from the repair / maintenance bays can negatively impact stormwater if allowed to come into contact with stormwater runoff. Therefore, design plans for repair bays must include the following:
 - a) Repair / Maintenance Bays must be indoors or designed in such a way that doesn't allow stormwater run-on or contact with stormwater runoff.
 - b) Design a Repair / Maintenance Bay drainage system to capture all wash water, leaks and spills. Connect drains to a sump for collection and disposal. Direct connection of the repair / maintenance bays to the storm drain system is prohibited. If required by local jurisdiction, obtain an Industrial Waste Discharge Permit.
- 3) Properly Design Vehicle / Equipment Wash Areas - The activity of vehicle / equipment, washing / steam cleaning has the potential to contribute metals, oil and grease, solvents, phosphates, and suspended solids to the stormwater conveyance system. Include in the project plans, an area for washing / steam cleaning of vehicles, and equipment. The area in the site design must be:
 - a) Self-contained and / or covered, equipped with a clarifier, or other pretreatment facility, and
 - b) Properly connected to a sanitary sewer or other appropriately permitted disposal facility.



3.2.2 Restaurants

- 1) Properly Design Equipment / Accessory Wash Areas - The activity of outdoor equipment/accessory washing/steam cleaning, has the potential to contribute metals, oil and grease, solvents, phosphates, and suspended solids to the stormwater conveyance system. Include in the project plans an area for the washing / steam cleaning of equipment and accessories. This area must be:
 - a) Self-contained, equipped with a grease trap, and properly connected to a sanitary sewer.
 - b) If the wash area is to be located outdoors, it must be covered, paved, have secondary containment, and be connected to the sanitary sewer or other appropriately permitted disposal facility.

3.2.3 Retail Gasoline Outlets (SD-30)

- 1) Properly Design Fueling Area - Fueling areas have the potential to contribute oil and grease, solvents, car battery acid, coolant and gasoline to the stormwater conveyance system. The project plans must include the following BMPs:
 - a) The fuel dispensing area must be covered with an overhanging roof structure or canopy. The canopy's minimum dimensions must be equal to or greater than the area within the grade break. The canopy must not drain onto the fuel dispensing area, and the canopy downspouts must be routed to prevent drainage across the fueling area.
 - b) The fuel dispensing area must be paved with Portland cement concrete (or equivalent smooth impervious surface), and the use of asphalt concrete shall be prohibited.
 - c) The fuel dispensing area must have a 2% to 4% slope to prevent ponding, and must be separated from the rest of the site by a grade break that prevents run-on of stormwater to the extent practicable.
 - d) At a minimum, the concrete fuel dispensing area must extend 6.5 feet (2.0 meters) from the corner of each fuel dispenser, or the length at which the hose and nozzle assembly may be operated plus 1 foot (0.3 meter), whichever is less.

3.2.4 Automotive Repair Shops

- 1) Properly Design Fueling Area - Fueling areas have the potential to contribute oil and grease, solvents, car battery acid, coolant and gasoline to the stormwater conveyance system. Therefore, design plans, which include fueling areas, must contain the following BMPs:
 - a) The fuel dispensing area must be covered with an overhanging roof structure or canopy. The canopy's minimum dimensions must be equal to or greater than the area within the grade break. The



canopy must not drain onto the fuel dispensing area, and the canopy downspouts must be routed to prevent drainage across the fueling area.

- b) The fuel dispensing area must be paved with Portland cement concrete (or equivalent smooth impervious surface), and the use of asphalt concrete shall be prohibited.
 - c) The fuel dispensing area must have a 2% to 4% slope to prevent ponding, and must be separated from the rest of the site by a grade break that prevents run-on of stormwater to the extent practicable.
 - d) At a minimum, the concrete fuel dispensing area must extend 6.5 feet (2.0 meters) from the corner of each fuel dispenser, or the length at which the hose and nozzle assembly may be operated plus 1 foot (0.3 meter), whichever is less.
- 2) Properly Design Repair / Maintenance Bays - Oil and grease, solvents, car battery acid, coolant and gasoline from the repair / maintenance bays can negatively impact stormwater if allowed to come into contact with stormwater runoff. Therefore, design plans for repair bays must include the following:
- a) Repair / Maintenance Bay must be indoors or designed in such a way that doesn't allow stormwater run-on or contact with stormwater runoff.
 - b) Design a Repair / Maintenance Bay drainage system to capture all wash-water, leaks and spills. Connect drains to a sump for collection and disposal. Direct connection of the Repair / Maintenance Bays to the storm drain system is prohibited. If required by local jurisdiction, obtain an Industrial Waste Discharge Permit.
- 3) Properly Design Vehicle / Equipment Wash Areas - The activity of vehicle / equipment – washing / steam cleaning has the potential to contribute metals, oil and grease, solvents, phosphates, and suspended solids to the stormwater conveyance system. Include in the project plans an area for washing / steam cleaning of vehicles and equipment. This area must be:
- a) Self-contained and / or covered, equipped with a clarifier, or other pretreatment facility, and properly connected to a sanitary sewer or other appropriately permitted disposal facility.
- 4) Properly Design Loading / Unloading Dock Areas – Loading / unloading dock areas have the potential for material spills to be quickly transported to the stormwater conveyance system. To minimize this potential, the following design criteria are required:
- a) Cover loading dock areas or design drainage to minimize run-on and runoff of stormwater.



- b) Direct connections to storm drains from depressed loading docks (truck wells) are prohibited.

3.2.5 Parking Lots

- 1) Properly Design Parking Area - Parking lots contain pollutants such as heavy metals, oil and grease, and polycyclic aromatic hydrocarbons that are deposited on parking lot surfaces by motor-vehicles. These pollutants are directly transported to surface waters. To minimize the offsite transport of pollutants, the following design criteria are required:
 - a) Reduce impervious land coverage of parking areas.
 - b) Infiltrate or treat runoff.
- 2) Properly Design To Limit Oil Contamination and Perform Maintenance - Parking lots may accumulate oil, grease, and water insoluble hydrocarbons from vehicle drippings and engine system leaks:
 - a) Treat to remove oil and petroleum hydrocarbons at parking lots that are heavily used (e.g. fast food outlets, lots with 25 or more parking spaces, sports event parking lots, shopping malls, grocery stores, discount warehouse stores).
 - b) Ensure adequate operation and maintenance of treatment systems, particularly sludge and oil removal, and system fouling and plugging prevention control.

3.2.6 Design Standards Applicable to All of the Above-Listed Priority Categories

The following are additional design standards applicable to all of the above-listed priority categories (Sections 3.2.1 – 3.2.5) as mandated by Attachment 4 of the Small MS4 NPDES Permit.

- 1) Peak Storm Water Runoff Discharge Rates

Post-development peak storm water runoff discharge rates shall not exceed the estimated pre-development rate for developments where the increased peak storm water discharge rate will result in increased potential for downstream erosion.
- 2) Conserve Natural Areas

If applicable, the following items are required and must be implemented in the site layout during the subdivision design and approval process, consistent with applicable General Plan and Local Area Plan policies:

 - a) Concentrate or Cluster Development on portions of a site while leaving the remaining land in a natural undisturbed condition.



- b) Limit clearing and grading of native vegetation at a site to the minimum amount needed to build lots, allow access, and provide fire protection.
 - c) Maximize trees and other vegetation at each site by planting additional vegetation, clustering tree areas, and promoting the use of native and / or drought-tolerant plants.
 - d) Promote natural vegetation by using parking lot islands and other landscaped areas.
 - e) Preserve riparian areas and wetlands.
- 3) Minimize Storm Water Pollutants of Concern

Storm water runoff from a site has the potential to contribute oil and grease, suspended solids, metals, gasoline, pesticides, and pathogens to the storm water conveyance system. The development must be designed so as to minimize, to the maximum extent practicable, the introduction of pollutants of concern that may result in significant impacts, generated from site runoff of directly connected impervious areas (DCIA), to the storm water conveyance system as approved by the building official. Pollutants of concern consist of any pollutants that exhibit one or more of the following characteristics: current loadings or historic deposits of the pollutant are impacting the beneficial uses of a receiving water, elevated levels of the pollutant are found in sediments of a receiving water and/or have the potential to bioaccumulate in organisms therein, or the detectable inputs of the pollutant are at concentrations or loads considered potentially toxic to humans and/or flora and fauna.

In meeting this specific requirement, “minimization of the pollutants of concern” will require the incorporation of a BMP or combination of BMPs best suited to maximize the reduction of pollutant loadings in that runoff to the Maximum Extent Practicable. Those BMPs best suited for that purpose are those listed in the *California Storm Water Best Management Practices Handbooks and the Caltrans Storm Water Quality Handbook: Planning and Design Staff Guide* as “likely to have significant impact” beneficial to water quality for targeted pollutants that are of concern at the site in question. However, it is possible that a combination of BMPs not so designated, may in a particular circumstance, be better suited to maximize the reduction of the pollutants.

4) Protect Slopes and Channels

Project plans must include BMPs consistent with local codes, ordinances, or other regulatory mechanism and the Design Standards to decrease the potential of slopes and/or channels from eroding and impacting storm water runoff:



- a) Convey runoff safely from the tops of slopes and stabilize disturbed slopes.
- b) Utilize natural drainage systems to the maximum extent practicable.
- c) Stabilize permanent channel crossings.
- d) Vegetate slopes with native or drought-tolerant vegetation, as appropriate.
- e) Install energy dissipaters, such as riprap, at the outlets of new storm drains, culverts, conduits, or channels that enter unlined channels in accordance with applicable specifications to minimize erosion, with the approval of all agencies with jurisdiction, e.g., the U.S. Army Corps of Engineers and the California Department of Fish and Game.

3.3 Drainage Zone Specific BMPs

The following is a listing and brief description of the BMPs required of all applicable new development in Lodi's drainage zones as described in [Section 1.3](#).

3.3.1 Direct Discharge to Mokelumne River Zone

All of the following BMPs apply to applicable new development and significant redevelopment in the areas that drain directly to the Mokelumne River as shown in [Figure 1](#):

3.3.1.1 Isolation of Private Drainage Systems (LODI-03)

All applicable non-residential development and redevelopment, which have a connection to the City's municipal storm drainage system and have on site "*significant liquid materials*", must install a mechanism to isolate the private storm sewer system from the City's system. "*Significant liquid materials*" include the following: liquids (other than potable water or retained stormwater) in aboveground tanks, vaults, or containers having an individual vessel capacity greater than 100 gallons; or the storage of more than ten liquid-containing 55-gallon drums; or a total aggregate liquid storage of more than 10,000 gallons; or a facility that has a wastewater pre-treatment system. Isolation mechanisms may include a valve or pump switch which, when closed or de-activated, will not allow liquids to pass beyond that point into the City's storm sewer system. Individual drain inlet control mechanisms / retrofits that provide a liquid-tight seal and closeable valve or plug may also be used. If it can be shown and supported with hydraulic calculations that *significant liquid materials* cannot reach certain drains or portions of the private drainage system, those drains and/or portions of the drainage system are exempt from this BMP requirement.



3.3.1.2 Spill Response Measures (LODI-04)

All non-residential applicable new development and significant redevelopment must have incorporated into its design a location for the storage of spill response equipment for materials stored or used at that facility and, at that storage location, post information on how to respond to a spill. For more information on Spill Response BMPs refer to CASQA Municipal BMP Handbook [SC-11](#).

3.3.1.3 Capture and Recovery of Nuisance Water (LODI-05)

All applicable non-residential development / redevelopment and residential development / redevelopment having more than two separate residences, must provide a mechanism to capture and divert nuisance flows away from the drain inlets or from flowing off-site and into a municipal storm drain. Discharges of de-chlorinated swimming pool water are exempted from this requirement. Flows may be diverted to a permeable surface or through an infiltration trench and allowed to percolate into the subsurface. Flows that percolate into the subsurface may not contain substances that will endanger groundwater quality. Nuisance flows are defined by the City of Lodi as unauthorized non-stormwater discharges as defined in the State of California Industrial General Permit.

3.3.2 Discharge to the Woodbridge Irrigation District Zone

All of the following BMPs apply to applicable new development and significant redevelopment in the areas that drain to the Woodbridge Irrigation District as shown in [Figure 2](#):

3.3.2.1 Capture and Recovery of Nuisance Water (LODI-05)

Same as the requirements identified in Section 3.3.1.3.



3.4 Treatment Control Options for State of California Priority Categories and Lodi Specified Industries

Applicable new developments and significant redevelopments must incorporate into their design a properly sized treatment control measure, or combination of control measures, that are selected to treat / remove the potential pollutants associated with the development. Sizing criteria are discussed in [Section 2.3.4](#) of this plan. A development-wide control measure may be used for developments where there are multiple types of land use as long as it addresses all of the pollutants of concern for each land usage and is adequately sized for the entire development. For sizing criteria information, refer to [Appendix B](#). The following is a listing and brief description of the approved treatment control measures.

3.4.1 Vegetated Buffer Strips (TC-31)

Vegetated buffer strips, also called grass strips, are areas of uniformly graded vegetated surfaces that are designed to receive sheet flow from impervious surfaces. They reduce the velocity of the sheet flow and evenly distribute the runoff. The grass strips act as a biofilter to allow solids and other pollutants to settle out of the runoff. They must be adequately designed using flow-based design criteria. For design criteria details refer to CASQA New Development BMP Handbook [TC-31](#).

3.4.2 Vegetated Swales (TC-30)

Vegetated swales, also called grassy swales, are open vegetated swales with gradual sloping sides that by a slight downward gradient slowly convey stormwater to the downstream point of discharge. Grassy swales will reduce the velocity of the stormwater flow and act as a biofilter to allow solids and other pollutants to settle out of the runoff. They must be adequately designed using flow-based design criteria. For design criteria details refer to CASQA New Development BMP Handbook [TC-30](#).

3.4.3 Extended Detention Basin (TC-22)

Extended detention basins are shallow excavated depressions or areas built up with berming that act as a temporary holding for stormwater. Extended detention basins typically allow a temporary stormwater impoundment depth of one to three feet, have an outlet that allows a slow discharge of water to the discharge point, and are typically dry between storm events. The benefits of an extended detention basin include the settling of particulate matter, reduction of the peak stormwater runoff volume for flood control and water quality enhancements, reduction of runoff velocity, and the promotion of biofiltering and conversion of pollutants. The extended detention basin must be adequately designed using volume-based design criteria. For design criteria details refer to CASQA New Development BMP Handbook [TC-22](#).



3.4.4 Wet Pond (TC-20)

A wet pond is similar in design to an extended detention basin with the exception that it is designed to hold water for a longer period of time. The concept of a wet pond is that incoming water from a storm event displaces the existing water from the previous storm event. Typically, water impoundment depths are deeper in the wet pond than in an extended detention basin. Like the extended detention basin, the benefits of a wet pond include the settling of particulate matter in the stormwater, reduction of the peak stormwater runoff volume for flood control and water quality enhancements, reduction of runoff velocity, and the promotion of biofiltering and conversion of pollutants. The wet pond must be adequately designed using volume-based design criteria. For design criteria details refer to CASQA New Development BMP Handbook [TC-20](#).

3.4.5 Constructed Wetland (TC-20 & MP-20)

Very few projects in Lodi will be able to use a constructed wetland treatment control due to restrictions in the size of the lot and not having a permanent water source. However, this treatment control BMP is included as an option because there are a few areas at Lodi that would be able to accommodate and benefit from this type of treatment. It should be noted that a constructed wetland differs greatly from a natural wetland in how it is regulated. Stormwater flows should not be allowed to discharge without treatment to a natural wetland. Natural wetlands can be incorporated into a constructed wetland, but require State and Federal approval to do so. State and Federal approval are not required for a constructed wetland that does not integrate a natural wetland. The benefits of a constructed wetland include the allowing of settling of particulate matter in the stormwater, reduction of the peak stormwater runoff volume for flood control and water quality enhancements, reduction of runoff velocity, and the promotion of biofiltering, biological uptake, and conversion of pollutants. The constructed wetland must be adequately designed using volume-based design criteria. For design criteria details refer to CASQA New Development BMP Handbook [TC-20](#) and [MP-20](#).

3.4.6 Detention Basin / Sand Filter (TC-40)

A detention basin / sand filter is a detention basin that is separated into a fore bay and sand filter storage zone. The sand filter consists of a type of a French drain; perforated pipe placed in gravel and covered by at least 18" of sand. The water leaches through the sand and gravel pack and is discharged via the subsurface collection system. This allows for filtering of solids and particulates in the stormwater. Oils and greases will also tend to be trapped in the detention basin. The detention basin / sand filter must be adequately designed using volume-based design criteria. For design criteria details refer to CASQA New Development BMP Handbook [TC-40](#).



3.4.7 Porous Pavement Detention (TC-40 & SD-20)

Similar in concept to the detention basin / sand filter is the porous pavement detention. The concept uses porous pavement blocks that are laid on a sand bed on top of a French drain type collection system. The area is graded to allow approximately two inches of water to accumulate on the pavers. The water infiltrates through the pavers and sand and into the subsurface stormwater collection system, which discharges the water to the facility's outfall. The porous pavement detention must be adequately designed using volume-based design criteria. For design criteria details refer to CASQA New Development BMP Handbook [TC-40](#) and [SD-20](#).

3.4.8 Porous Landscape Detention (TC-32 & TC-40)

Porous landscape detention function similarly to the porous pavement detention except that vegetation is used instead of pavers. The porous landscape detention must be adequately designed using volume-based design criteria. For design criteria details refer to CASQA New Development BMP Handbook [TC-32](#) and [TC-40](#).

3.4.9 Infiltration Basin (TC-11)

The infiltration basin (also called a detention or retention basin) is different from the various types of detention basins discussed above in that they are designed to hold all of the incoming stormwater flow and allow the water to infiltrate (percolate) into the ground. To be successful, these infiltration basins must be located where natural soils have high percolation rates. The benefits include allowing the facility to greatly reduce the number of discharges to surface waters (potentially to zero-discharge) and provide for groundwater recharge. The disadvantages include the possibility of contaminating groundwater, the large amount of area required, and their potential for clogging. The infiltration basin must be adequately designed using volume-based design criteria. For design criteria details refer to CASQA New Development BMP Handbook [TC-11](#).

3.4.10 Infiltration Trench (TC-10)

The infiltration trench functions like a leach field for stormwater. A trench filled with rock and/or sand temporarily receives the stormwater and allows it to infiltrate into soils that have high permeability rates. A collection pipe may be installed to allow the water to be diverted in case of heavy flow or clogging. Usually, a vegetated strip surrounds the infiltration trench. In the right application, with the proper soil conditions, the infiltration trench can eliminate discharges of stormwater. The infiltration trench must be adequately designed using volume-based design criteria. For design criteria details refer to CASQA New Development BMP Handbook [TC-10](#).



3.4.11 Media Filter (TC-40 and MP-40)

The media filter is a constructed filter that uses sand and/or other media to filter stormwater. It works similar to the sand filters discussed above, except that this design is typically contained in a constructed vault system. The three most common designs include the Austin Sand Filter System, the DC Underground Sand Filter, and the Delaware Sand Filter. There are also various proprietary systems marketed that use many different filter media types, which are selected to filter (“treat”) targeted pollutants. Media filters must be adequately designed using volume-based design criteria. For design criteria details refer to CASQA New Development BMP Handbook [TC-40](#) and [MP-40](#), and, also, manufacturer specifications and literature.

3.4.12 Wet Vaults, Oil / Water Separators, and Vortex Separators (MP-50 & MP-51)

Wet vaults (more commonly referred to as oil / water separators or sand interceptors) and vortex separators may be used as treatment controls for certain applications where the pollutants are limited to floatable and/or sinkable material. These units may be effectively used in conjunction with other treatment controls such as media filtration, but are not sufficient by themselves to remove suspended or dissolved material. For design criteria details refer to CASQA New Development BMP Handbook [MP-50](#) and [MP-51](#), and, also, manufacturer specifications and literature.

3.4.13 Retention / Irrigation (TC-12)

The retention / irrigation control measure involves the retention of stormwater runoff and the subsequent reuse of it as irrigation water on landscaping. For the right application, this may allow the facility to obtain zero discharge. The down side to this treatment control is that during flooded or saturated conditions, the irrigation option is not permitted to be used. To adequately size the retention basin, volume-based design criteria must be used. For design criteria details refer to CASQA New Development BMP Handbook [TC-12](#).

3.4.14 Alternative Control Measures and Proprietary Control Measures (LODI-99)

The above-described treatment controls are recognized by the USEPA, State of California, and the City of Lodi as effective control measures for industrial, commercial, residential, and municipal applications. Therefore, the proper selection of any of the above-described control measures will facilitate the approval process. However, the City of Lodi also recognizes that these are not the only effective treatment controls available and may not be the best treatment control for a particular development. Therefore, the City of Lodi will allow for alternative proprietary and non-proprietary control measures to be proposed for use in the design. As with any treatment control measure, they must be properly sized following the



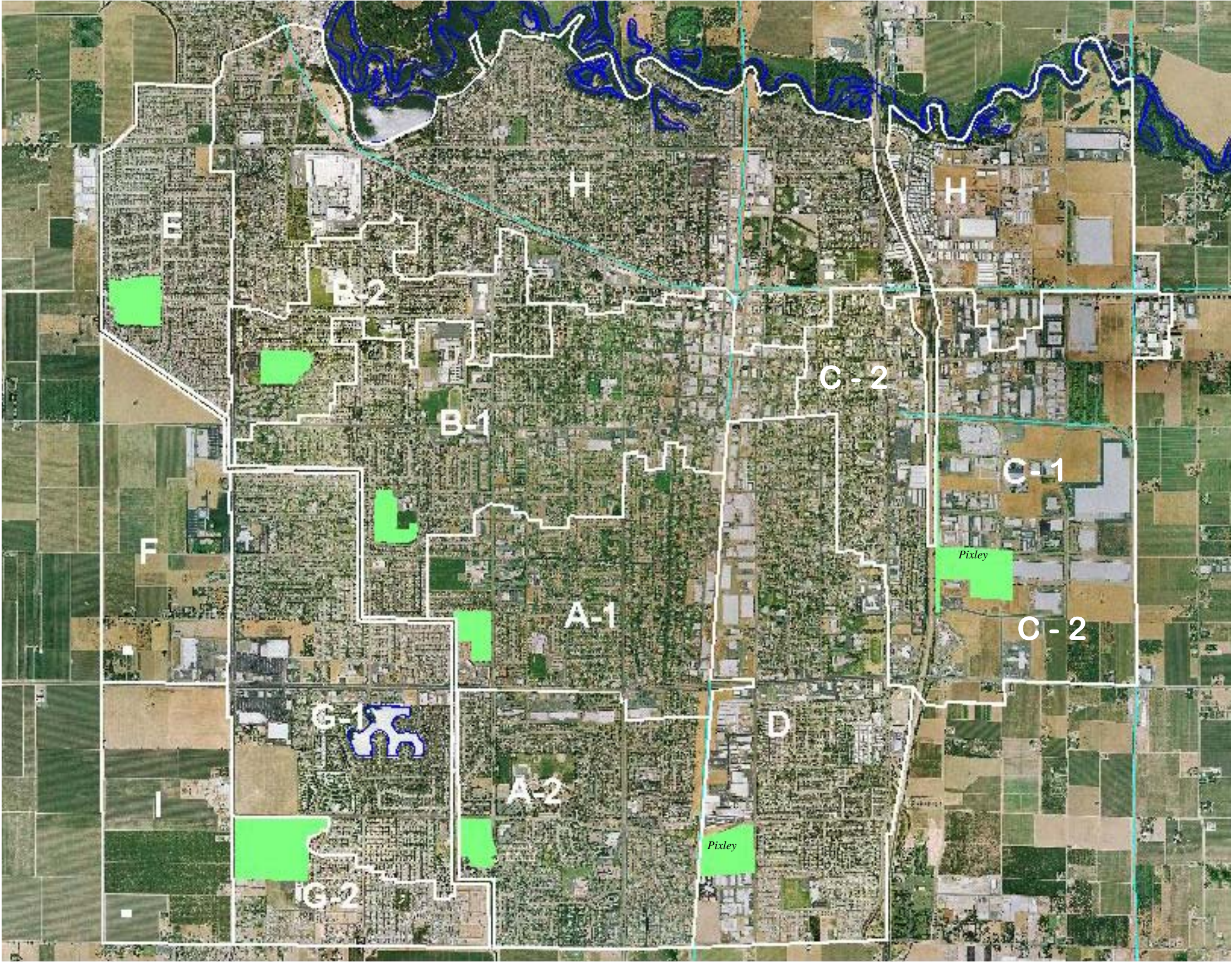
sizing criteria described in [Section 2.3.4](#) of this plan. Lodi reserves the right to accept or reject any proposed treatment controls on the basis of an engineering review, questions concerning its effectiveness, potential to impact surface water or groundwater, land use of the facility or neighboring facilities, risk of treatment bypass or failure, and health or vector control issues. It is the developer's responsibility to demonstrate that the proposed treatment control is properly sized and will be effective to achieve Lodi's water quality goals.

4.0 Development Standards Plan Approval and Accessibility

This Development Standards Plan (DSP) was prepared by the City of Lodi Public Works Department and was reviewed and approved by the Director of Public Works, on _____, and by the City Manager on _____. A draft of this Development Standards Plan was submitted to the Lodi City Council on _____ and was approved to be submitted to the Central Valley Regional Water Quality Control Board (RWQCB) on _____. A draft of the plan was submitted to the RWQCB on _____ and approval was received from the RWQCB on _____. The City Council implemented the RWQCB-approved DSP on _____ by approving an ordinance to make the DSP and requirements contained in it mandatory for all developers and significant redevelopers beginning on _____. The City of Lodi DSP is a public accessible document and may be obtained by contacting the Public Works Department at (209) 333-6706 or by downloading it at <http://www.lodi.gov/stormwater/index.html>.

Appendix A
City of Lodi Drainage Basin Map

City of Lodi
Stormwater Basin Drainage Areas Map



Basin/Park	Tributary Area (acres)	Site Land Area (acres)	Detention Capacity (ac.ft.)	How low and nuisance flows are handled.
A-1, Kofu	491	12 ¹	41.5	Pumped to the WID
A-2, Beckman	564	16.2 ²	60.0	Pumped to the WID
B-1, Vinewood	964	16.0	41.5	Pumped to the WID
B-2, Glaves ³	450	13.2	31.1	Pumped/flows to Mokelumne R.
C -1	Approx. 591			Pumped/flows to the Mokelumne R.
C-2, <i>Pixley</i> ⁴	Approx. 500	27.3	128.7	Pumped/flows to Pixley
D, Salas	790	21.0	94.0	Pumped to the WID
E, Peterson	340	20.9	61.0	Pumped/flows to the Mokelumne R.
F (at Kettleman)		30.0	68.5	Pumped/flows to DeBenedetti
F (near Tokay)	369	30.0	68.5	Pumped/flows to DeBenedetti
G (DeBenedetti)	866	46.3	202.0	Detains its own flows
H (Discharge to River)	428			Pumped/flows to the Mokelumne R.
I (Undeveloped)	320	25.0		Pumped/flows to DeBenedetti
Total:	6,673	227.9	728.3	

Appendix B

Forms and Applications

City of Lodi

Development Standards Plan Worksheet



Project Name: _____



1 PROJECT DESCRIPTION

1.1 Project Information

Project Information:	
Name of Project:	
Address:	
General Location:	
Project Size: (indicate sq. ft. or acres)	
Anticipated Construction Start Date:	
Anticipated Construction End Date:	
Owner Information:	
Name:	
Address:	
Contact Name:	
Telephone No.:	
Developer Information:	
Name:	
Address:	
Contact Name:	
Telephone No.:	
Hydrology Information:	
Percent Impervious before Construction:	
Percent Impervious after Construction:	
Runoff Coefficient before Construction:	
Runoff Coefficient after Construction:	
Peak Runoff (cfs) before Construction:	
Peak Runoff (cfs) after Construction:	



1.2 Type of Project

Choose one of the following:

☐ **New Development**

☐ **Applicable Redevelopment** as defined by defined as the creation or addition of at least 5,000 sq. ft. of impervious surfaces on an already developed site. Significant redevelopment does not include replacement of impervious surfaces that is a part of routine maintenance, such as the repair and/or replacement of an asphalt parking lot; or the replacement of a building(s) or other structures where the net increase of impervious surface is less than 5,000 sq. ft.

1.3 Project Category

Check the Appropriate Project Categories

(DSP Table 2.3.3.1 – New Development Priority Categories and Pollutants of Concern¹)

Applicable Categories (Check all that apply to the proposed development)	New Development Project Category	Pollutant Category of Concern						
		Sediment	Nutrients	Metals	Trash & Debris	Oxygen Demand	Toxic Organics	Bacteria
<input type="checkbox"/>	Commercial Developments (>=100,000 sf)	X	X	X	X	X	X	X
<input type="checkbox"/>	Automotive Repair Shops	X		X	X	X	X	
<input type="checkbox"/>	Retail Gasoline Outlets	X		X	X	X	X	
<input type="checkbox"/>	Restaurants		X		X	X	X	X
<input type="checkbox"/>	Parking Lots (>=5,000 sf or 25 spaces)	X		X	X	X	X	
<input type="checkbox"/>	Home Subdivisions (>=10 units)	X	X	X	X	X	X	X

X = Pollutant likely to be present in stormwater runoff from the project area

¹ Source of the table is the Small MS4 NPDES General Permit (Water Quality Order 2003-0005-DWQ), Attachment 4, page 2 and CASQA New Development and Redevelopment Handbook, January 2003 edition, Table 2-1, page 2-7



Lodi has identified industrial activities that are common to the business within the City and have identified pollutants of concern for each of the listed activities.

Table 2.3.3.2 – Lodi Specified Industrial Activities and Pollutants of Concern

Applicable Categories (Check all that apply to the proposed development)		Toxic Organics	Sulfur, Sulfides, Sulfates	Nutrients	Metals	Trash & Debris	Oxygen Demand	Oil & Grease	Bacteria	pH	Dissolved Solids	Suspended Solids	Sediment
<input type="checkbox"/>	Cement, Concrete, and Aggregate Operations	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
<input type="checkbox"/>	Sulfur Distribution, Storage and Handling	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
<input type="checkbox"/>	Wineries, wine processing and packaging.	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
<input type="checkbox"/>	Agricultural Products Storage & Handling	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
<input type="checkbox"/>	Other Chemical Storage & Handling	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
<input type="checkbox"/>	Food Products Processing, Storage & Handling	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
<input type="checkbox"/>	Paper and Plastic Recycling	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
<input type="checkbox"/>	Auto Wrecking, Dismantling, and Body Shops; Metal Salvage / Recycling	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
<input type="checkbox"/>	Railroad Operations	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>
<input type="checkbox"/>	Highways and Freeways	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input checked="" type="checkbox"/>

X = Pollutant likely to be present in stormwater runoff from the project area

1.4 Site Drainage Characteristics

Describe how the property drains prior to construction and how it will drain after the proposed construction. Identify hard connections and surface flow to the City's storm drainage system. Describe the proposed stormwater conveyance system. Provide the pre and post construction percent impervious and runoff coefficients.



2 BEST MANAGEMENT PRACTICE SELECTIONS

This section identifies the Best Management Practices (BMPs) selected for the proposed new development to reduce predictable pollutants in runoff entering nearby storm drain systems. The control measures listed herein are taken from Section 3 of the Development Standards Plan (DSP).

Mandatory Minimum BMPs:

(Mark Yes or NA as applicable to your project)

Yes	NA	Reference No.	BMP
		SD-13	Storm drain message and signage
		SD-11	Roof drain design
		SD-34	Outdoor material storage area design
		SD-32	Outdoor trash storage area design
		SD-31	Outdoor loading / unloading dock area design
		SD-35	Outdoor repair / maintenance bay design
		SD-33	Outdoor vehicle, equipment, accessory washing area design
		LODI-01	Swimming pool and fountain filters
		LODI-02	Sample/observation box

Priority-Category BMPs:

(Mark Yes or NA as applicable to your project)

Yes	NA	DSP Section	BMP
		3.2.1	100,000 sq. ft. commercial developments
		3.2.2	Restaurants
		3.2.3	Retail gasoline outlets
		3.2.4	Automotive repair shops
		3.2.5	Parking lots

Drainage Zone Specific BMPs:

(Mark Yes or NA as applicable to your project)

Yes	NA	Reference No.	BMP
<i>Direct Discharge to Mokelumne River Zone (B-2, C-1, E, & H drainage basins)</i>			
		LODI-03	Isolation of private drainage systems
		LODI-04	Spill response measures
		LODI-05	Capture and recovery of nuisance water
<i>Discharge to Woodbridge Irrigation District Zone (A-1, A-2, B-1, & D drainage basins)</i>			
		LODI-05	Capture and recovery of nuisance water

For Additional BMP Detail Refer to the Following Reference:

CASQA Stormwater New Development BMP Handbook
<http://www.cabmphandbooks.com/Development.asp>



Treatment Control BMPs:

(Mark selection. Treatment control is mandatory for applicable new development and significant redevelopment. Refer to Section 3.4 of the DSP.)

Yes	No	Reference No.	BMP	Design Criteria
		TC-31	Vegetated buffer strips	SQDF
		TC-30	Vegetated swales	SQDF
		TC-22	Extended detention basin	SQDV
		TC-20	Wet pond	SQDV
		TC-20, MP-20	Constructed wetland	SQDV
		TC-40	Detention basin / sand filter	SQDV
		TC-40, SD-20	Porous pavement detention	SQDV
		TC-32, TC-40	Porous landscape detention	SQDV
		TC-11	Infiltration basin	SQDV
		TC-10	Infiltration trench	SQDV
		TC-40, MP-40	Media filter	SQDV
		MP-50, MP-51	Wet vaults, oil/water separators, and vortex separators	SQDF
		TC-12	Retention / irrigation	SQDV
		LODI-99	Alternative and proprietary control measures	Variable

3 Treatment Control Measure Sizing

Flow Based Sizing Calculation:

Formula:

Stormwater Quality Design Flow (SQDF) = 0.20 in/hr x C x Area

- The 85th % for hourly rainfall intensity for the Lodi area = 0.10 in/hr.
- Design rainfall intensity (I):
 $I = 0.10 \text{ (in/hr)} \times 2 = 0.20 \text{ in/hr}$
- Determine the project drainage area (A) in ft²
- Weighted average runoff coefficient (C) for each individual area²
- SQDF = 0.20 in/hr x C x Area**

Calculate the SQDF for each of the sub-drainage areas having different coefficients and sum the SQDFs for a total site SQDF.

Type of Drainage Area	Runoff Coefficient
Business:	
Downtown areas	0.70 - 0.95
Neighborhood areas	0.50 - 0.70
Residential:	
Single-family areas	0.30 - 0.50
Multi-units, detached	0.40 - 0.60
Multi-units, attached	0.60 - 0.75
Suburban	0.25 - 0.40
Apartment dwelling areas	0.50 - 0.70
Industrial:	
Light areas	0.50 - 0.80
Heavy areas	0.60 - 0.90
Parks, cemeteries:	0.10 - 0.25
Playgrounds:	0.20 - 0.40
Railroad yard areas:	0.20 - 0.40
Unimproved areas:	0.10 - 0.30
Lawns:	
Sandy soil, flat, 2%	0.05 - 0.10
Sandy soil, average, 2-7%	0.10 - 0.15
Sandy soil, steep, 7%	0.15 - 0.20
Heavy soil, flat, 2%	0.13 - 0.17
Heavy soil, average, 2-7%	0.18 - 0.25
Heavy soil, steep, 7%	0.25 - 0.35
Streets:	
Asphaltic	0.70 - 0.95
Concrete	0.80 - 0.95
Brick	0.70 - 0.85
Drives and walks	0.75 - 0.85
Roofs:	0.75 - 0.95

² Table 819.2B taken from the Caltrans Stormwater Quality Handbooks, SWPPP/WPCP Preparation Manual Computation Sheet for Determining Runoff Coefficients, February 1, 2003



Volume Based Sizing Calculation:

Formulas:

Stormwater Quality Design Volume (SQDV) =

Unit Basin Storage Volume for 80% Annual Capture (V_{unit}) x Total Area (A_{total})

Where V_{unit} is derived from Figure 2 using the effective imperviousness (I_{wq})

and I_{wq} is derived from Figure 1 using the percentage of impervious area of the project.

Percentage of impervious area = (area impervious)/ A_{total} x 100

1. Determine total drainage area (A_{total})
2. Determine the percentage of impervious area (I_a):
 $I_a = \text{Impervious area}/100$
3. Determine the Effective imperviousness (I_{wq}) using **Figure 1**³.
4. Determine the appropriate drawdown period for the selected BMP.
5. Determine the unit basin storage volume (V_u) using **Figure 2**⁴.
6. Calculate SQDV

$$\begin{aligned} \text{SQDV} &= V_u \times A_{total} \\ &= (V_u \text{ "inches"}) \times (1 \text{ ft}/12 \text{ inches}) \times \\ &\quad (A_{total} \text{ "acres"}) \times (43,560 \text{ ft}^2/\text{acre}) \\ &= \text{ft}^3 \end{aligned}$$

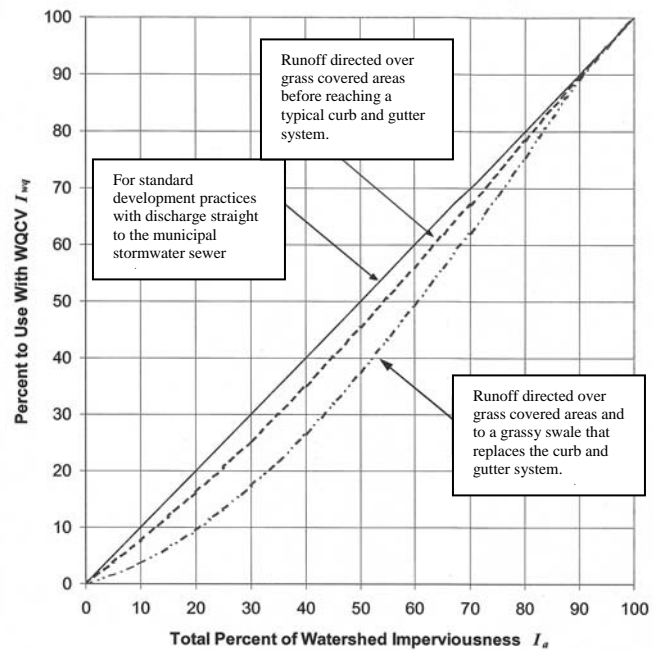


Figure 1³

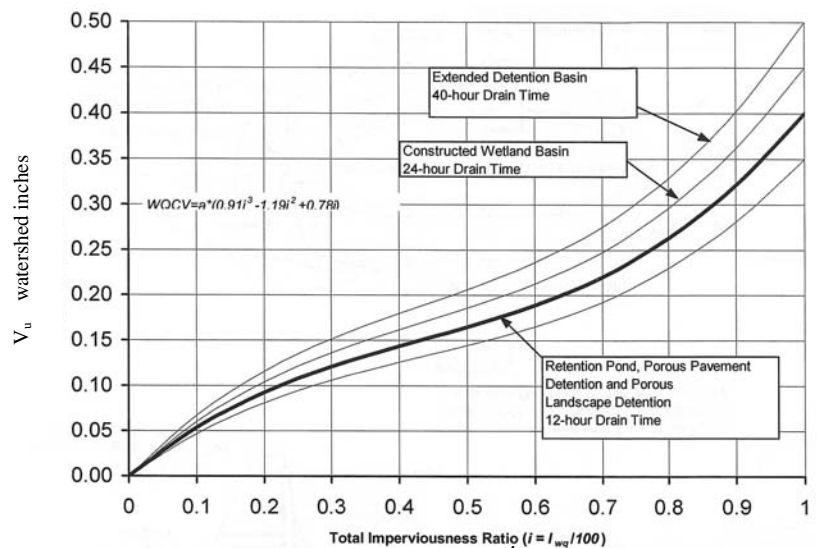


Figure 2⁴

³ Figure 1 is adapted from Urban Drainage and Flood Control District Figure ND-1 of the Drainage Criteria Manual (Volume 3), Revised August 2006, page ND-9

⁴ Figure 2 is adapted from Urban Drainage and Flood Control District Figure RP-2 of the Drainage Criteria Manual (Volume 3), Revised August 2006, page S-102



Reference Resources:

1. CASQA Stormwater BMP Handbook for New Development and Redevelopment
<http://www.cabmphandbooks.com/Development.asp>
2. Urban Drainage and Flood Control District (UDFCD) Drainage Criteria Manual Volume 3,
Revised August 2006
<http://www.udfcd.org/index.html>
3. EPA Stormwater Best Management Practice Design Guide (EPA/600/R-04/121)
September 2004
www.epa.gov/nrmrl/pubs/600r04121/600r04121sect4.pdf

Exhibits to Attach to this Worksheet:

Exhibit A – Vicinity Map

Exhibit B – Site Map

Exhibit C – Treatment Control Specifications

Exhibit D – Treatment Control Sizing Calculations

Exhibit E – Access and Maintenance Agreement

**Storm Water Treatment Device
Access and Maintenance
Agreement**

After recorded, return to:
Public Works
City of Lodi
221 W. Pine Street
Lodi, CA 95240

PUBLIC WORKS DEPARTMENT
After Recording Transmit Copy to:

___ Owner of Record
___ Public Works Department
___ City Clerk (Original)

OWNER NAME (S)
(as shown on deed)

MAILING ADDRESS

**FACILITY NAME
AND ADDRESS**

ASSESSOR PARCEL NO.

THIS AGREEMENT is made and entered into in _____, California,
this ____ day of _____, by and between _____
hereinafter referred to as "Owner" and the CITY OF LODI, a municipal corporation, located in
the County of San Joaquin, State of California hereinafter referred to as "CITY";

WHEREAS, the Owner owns real property ("Property") in the City of Lodi, County of
San Joaquin, State of California, depicted in Exhibits A and B, which are attached hereto and
incorporated herein by this reference;

WHEREAS, at the time of initial approval of development project known as

_____ within the Property described herein, the City required the project to employ on-site control measures to minimize pollutants in urban runoff;

WHEREAS, the Owner has chosen to install a _____, hereinafter referred to as "Device", as the on-site control measure to minimize pollutants in urban runoff;

WHEREAS, said Device has been installed in accordance with the requirements of the City of Lodi Development Standards Plan and the Owner's plans and specifications accepted by the City;

WHEREAS, said Device, with installation on private property and draining only private property, is a private facility with all operation, maintenance and replacement, therefore, the sole responsibility of the Owner in accordance with the terms of this Agreement;

WHEREAS, the Owner is aware that periodic and continuous maintenance, including, but not necessarily limited to, sediment removal, is required to assure peak performance of Device and that, furthermore, such maintenance activity will require compliance with all Local, State, or Federal laws and regulations, including those pertaining to confined space and waste disposal methods, in effect at the time such maintenance occurs;

NOW THEREFORE, it is mutually stipulated and agreed as follows:

1. Owner hereby provides the City or City's designee complete access, of any duration, to the Device and its immediate vicinity at any time, upon reasonable notice, or in the event of emergency, as determined by City's Director of Public Works with no advance notice, for the purpose of inspection, sampling, testing of the Device, and in case of emergency, to undertake all necessary repairs or other preventative measures at owner's expense as provided in paragraph 3 below. The Owner/Operator shall retain all operation and maintenance records at the facility for City inspection, and a copy shall be provided to the City if requested. City shall make every effort at all times to minimize or avoid interference with Owner's use of the Property.
2. Owner shall use its best efforts to diligently maintain the Device in a manner assuring peak performance at all times. All reasonable precautions shall be exercised by Owner and Owner's representative or contractor in the removal and extraction of material(s) from the Device and the ultimate disposal of the material(s) in a manner consistent with all relevant laws and regulations in effect at the time. When requested from time to time by the City, the Owner shall provide the City with documentation identifying the material(s) removed, the quantity, and disposal destination.
3. In the event Owner, or its successors or assigns, fails to accomplish the necessary maintenance contemplated by this Agreement, within five (5) days of being given written notice by the City, the City is hereby authorized to cause any maintenance necessary to be done and charge the entire cost and expense to the Owner or Owner's successors or assigns, including administrative costs, attorneys fees and interest thereon at the maximum rate

authorized by the Civil Code from the date of the notice of expense until paid in full, and Owner hereby agrees to pay such charge within 30 days of receipt of City's written demand for payment.

4. The City may require the owner to post security in form and for a time period satisfactory to the City of guarantee the performance of the obligations stated herein. Should the Owner fail to perform the obligations under the Agreement, the City may, in the case of a cash bond, act for the Owner using the proceeds from it, or in the case of a surety bond, require the sureties to perform the obligations of the Agreement. As an additional remedy, the Director may withdraw any previous stormwater related approval with respects to the property on which a Device has been installed until such time as Owner repays to City its reasonable costs incurred in accordance with paragraph 3 above.
5. This agreement shall be recorded in the Office of the Recorder of San Joaquin County, California, at the expense of the Owner and shall constitute notice to all successors and assigns of the title to said Property of the obligation herein set forth, and also a lien in such amount as will fully reimburse the City, including interest as herein above set forth, subject to foreclosure in event of default in payment.
6. In event of legal action occasioned by any default or action of the Owner, or its successors or assigns, then the Owner and its successors or assigns agree(s) to pay all costs incurred by the City in enforcing the terms of this Agreement, including reasonable attorney's fees and costs, and that the same shall become a part of the lien against said Property.
7. It is the intent of the parties hereto that burdens and benefits herein undertaken shall constitute covenants that run with said Property and constitute a lien there against.
8. The obligations herein undertaken shall be binding upon the heirs, successors, executors, administrators and assigns of the parties hereto. The term "Owner" shall include not only the present Owner, but also its heirs, successors, executors, administrators, and assigns. Owner shall notify any successor to title of all or part of the Property about the existence of this Agreement. Owner shall provide such notice prior to such successor obtaining an interest in all or part of the Property. Owner shall provide a copy of such notice to the City at the same time such notice is provided to the successor.
9. Time is of the essence in the performance of this Agreement.
10. Any notice or demand for payment to a party required or called for in this Agreement shall be served in person, or by deposit in the U.S. Mail, first class postage prepaid, to addresses listed on Page 1 of this agreement either for the Owner or City. Notice(s) shall be deemed effective upon receipt, or seventy-two (72) hours after deposit in the U.S. Mail, whichever is earlier. A party may change a notice address only by providing written notice thereof to the other party.

[illegible]

personally appeared _____, () personally known to me or () proved to me on the basis of satisfactory evidence to be the person(s) whose name(s) is/are subscribed to the within instrument and acknowledged to me that he/she/they executed the same in his/her/their authorized capacity(ies), and that by his/her/their signature(s) on the instrument the person(s), or the entity upon behalf of which the person(s) acted, executed the instrument.

Signature of Notary

EXHIBIT A

(Operation & Maintenance Plan)

EXHIBIT B

(Deed Copy)

